

**Lake Champlain Basin Science Center, Inc.
d/b/a ECHO Lake Aquarium and Science Center
At the Leahy Center for Lake Champlain**

**Final Grant Closure Report – Grant # LC97144701
For the Period: 10/01/05 through 05/31/11**

Introduction

ECHO Lake Aquarium and Science Center at the Leahy Center for Lake Champlain (ECHO) is an innovative lake aquarium and science center committed to educating residents and visitors about the ecology, culture, history and opportunities for stewardship of the Lake Champlain Basin. Since opening in 2003, this 28,500 square-foot facility located on the Waterfront in Burlington, Vermont has served approximately 150,000 visitors each year and has become a favorite destination for school children and visitors of all ages.

Through more than 100 interactive exhibits, 75 species of fish, reptiles and amphibians, major changing exhibits, classrooms and a lecture hall, ECHO encourages visitors to view the natural environment as part of their neighborhood and to explore, learn about and consider opportunities for stewardship. ECHO espouses the belief that once Lake Champlain Basin residents understand that we all live “upstream or downstream” from one another, they can and will take action to improve the future health of the Lake Champlain Basin.

This report is submitted to provide an overview of ECHO’s activities in relation to U.S. Environmental Protection Agency (EPA) Grant LC 97144701.

Grant Award History

Assistance ID Number	LC97144701-1	LC97144701-2	LC97144701-3	LC97144701-4	
Award Date	1/11/2006	9/21/2006	12/26/2007	7/7/2008	
Budget Period	10/1/2005	10/1/2005	10/1/2005	10/1/2005	
	3/31/2008	3/31/2008	3/31/2009	9/30/2010	
Project Period	10/1/2005	10/1/2005	10/1/2005	10/1/2005	
	3/31/2008	3/31/2008	3/31/2009	5/31/2011	
EPA Amount	\$644,865	\$689,385	\$250,000	\$683,000	\$2,267,250
ECHO Match Amount	214,740	261,668	83,334	227,667	787,409
Total Project Cost Amount	\$859,605	\$951,053	\$333,334	\$910,667	\$3,054,659

EPA Grant LC 97144701 Consolidated Budget:

Budget	
EPA Reimbursement Amount	
Personnel	\$782,411
Fringe Benefits	\$203,428
ECHO Open Door Access	\$712,984
Exhibits	\$58,724
ECHO Encounters	\$166,259
Indirect Costs	\$343,444
Total	\$2,267,250

ECHO Match Amount	
Personnel	\$466,971
Fringe Benefits	\$65,580
ECHO Open Door Access	\$118,577
Exhibits	\$0
ECHO Encounters	\$24,800
Indirect Costs	\$111,481
Total	\$787,409

Total Grant Expenditures	
Personnel	\$1,249,382
Fringe Benefits	\$269,008
ECHO Open Door Access	\$831,561
Exhibits	\$58,724
ECHO Encounters	\$191,059
Indirect Costs	\$454,925
Total	\$3,054,659

Program Descriptions and Results of Grant Activities

The following report, for each program activity, will define the activity and then describe the results of full implementation.

ECHO's Mission

ECHO's mission is to educate and delight people about the Ecology, Culture, History and Oppportunity for stewardship of the Lake Champlain Basin. ECHO strives to effectively serve a broad array of targeted audiences through the development and delivery of programs meeting demonstrated stewardship and science education needs in the community. ECHO continues to expand stewardship-focused, inquiry-based environmental education programs directly related to the Lake. Programs continue to be

co-delivered in partnership with schools, libraries, social service agencies and other partners.

Results: Total attendance from FY2006 to 2011 increased 14.3% from 126,275 in FY2006 to 144,302 in FY2011. A major focus of this grant, walk-up attendance (defined as families or individuals paying admission), increased 34.7% from FY2006 to FY2011. Smaller changes were seen for pre-booked groups, complimentary (defined as visitors associated with the Open Door Access Programs described below) member visits and evening events. See Chart 1 for an overview of the attendance patterns for the period FY2006 to FY2011.

Chart 1: ECHO Total Attendance FY2006 to FY2011

	FY2011	FY2010	FY2009	FY2008	FY2007	FY2006
Walk-up	81,931	80,073	81,583	79,671	80,917	60,782
Groups	9,777	13,594	13,225	9,803	9,986	11,766
Complimentary	18,036	17,617	16,808	18,000	18,662	16,543
Members	23,933	24,477	25,462	27,000	27,785	24,520
Events	10,625	11,048	14,391	15,903	16,957	12,664
Total	144,302	146,809	151,469	150,377	154,307	126,275

Annual funding from EPA Grant LC 97144701 went toward supporting the following ECHO programs:

Lake and Basin Education: ECHO Encounters

The success of the everyday guest experience rests in large part on ECHO's ability to engage and interact personally with guests during their visit. ECHO Encounters are about experiences that leave a lasting impression and provide guests a chance to reflect on their relationship with the Lake Champlain Basin. The dialogue that naturally occurs during ECHO Encounters between ECHO's guests and its staff represents one of the best ways to foster a personal connection to the Basin. The following describe the various ECHO Encounter programs that were delivered, audience impact as defined by audience feedback, and the size of the audience, during the grant period through the support of EPA Grant LC 97144701.

Daily Live Animal Feedings and Demonstrations

ECHO's exhibits, which are designed to be interactive and hands-on, are supplemented by daily live animal feedings and demonstrations. These 15 to 20 minute presentations, which are among our most popular offerings, allow guests the opportunity to view animals outside of their habitats and to ask questions in a more intimate setting. The informal discussions that often take place after the presentation allow guests to share their personal experiences and help further the sense that the Basin is "our" watershed that we are responsible for protecting. The consistent themes of lake conservation and restoration were included in all shows.

Results: Two animal feedings were provided daily resulting in 730 feedings annually provided to 5 to 85 (average 24) guests per show for an annual audience total of 17,520, or 105,120 guests during the six years of the grant. During this time period, seven new animal feeding demonstrations were created and delivered along with the seventeen animal feedings already defined. Lake Champlain Basin animals fed include: two species of frogs, five species of turtles, three species of snakes, two species of amphibians, and twelve species of fish in 13 aquaria. Demonstrations always include information about the life-history of the animal, ecological needs, human impacts, and special stories about how ECHO cares for the animals and the staff expertise required.

Guest comments: *"I never knew about the life-history of the American eel – they have a fascinating life."* – Grandfather with two grandkids. *"Because the fish live in the water, you can see why we need to take care of what we put in the water. The poor fish have to live in whatever we do – yuck!"* – stated by a Teenager.

Interactive Activities

Through ecological games, take-home crafts, manipulative toys and science experiments, guests can take a break from the floor exhibits to learn more while doing! Short, 15-20 minute, activities in one of our classrooms or our flexible open floor space provide fun, engaging enrichment to guests and leave a lasting impression. For example, the game "Web of Life," appropriate for any age group, teaches about the interdependence between all living things. Participants take on the roles of animals and plants within the Basin and create a web out of string that illustrates different "what-if" scenarios: If a pesticide harms a particular plant or animal, how would other plants and animals and their habitats be affected?

Results: Depending on the attendance, between two and ten activities were provided for guests daily. On average, 4 activities were provided by staff, volunteers and interns for, on average, 87 guests per day or 31,755 guest engagements per year. A sampling of the topics created and delivered are: earthworms, animal coverings, sturgeon, reptiles, watersheds, blue-green algae, gar, bowfin and nature journals.

Guest comments: *"I didn't know you (directed to his children) knew so much about the fish in the lake – where did you learn all this?"* – Dad to his elementary-aged children. *"I really like the ability to sit and learn with my child."* – Parent with two children. *"We come here weekly because we know there is always something new."* – Parent.

ECHO Inquiry Treks

These self-guided, scavenger hunts help direct the visitor learning experience. There are treks suitable for four age-levels, each trek based on ECHO's themes of ecology, culture, history and opportunity for stewardship, with multiple opportunities for participants to search for key information about the water quality, lake conservation and the different human impacts. Visitors will draw, count, read, inquire, estimate and write as they explore ECHO's exhibits. The Treks are an important part of the learning strategies utilized by visiting school groups. They provide direction for the students in a free-choice science center environment.

Results: The twelve treks are available online and in-person at ECHO. Forty-six percent of the visiting school groups utilized the Treks reaching, on average 5,224 students annually.

Guest Comments: *"It is evident from the assessment results that 70% of the children could make appropriate observations of characteristics of an animal and could recognize the vertebrate group/s that showed those characteristics. In addition, they could identify key ecological requirements for the animals and describe how the characteristics were necessary for survival."* - Elementary Teacher.

Story Time

These weekly presentations include stories and activities about animals, water, habitats and a whole range of science and cultural learning for younger audiences. Over the past year, our Tuesday morning story time has become enormously popular with a regular, growing group of attendees.

Results: The one hour Story Time is delivered once a week from September to May each year to an average of 32 family participants or reaching audience of 1,152 annually. The programs, while designed to engage children to age 4, also provide significant opportunities to engage interested parents. A new topic is provided each week. Sample of topics includes: food chains, fishy fun, ice, hibernation, camouflage, salmon spawning, sink and float, frog lifecycle, signs of spring and insects.

Guest comments: *"Elizabeth (the educator providing the program) has a wonderful book and activity for my toddler son each week."* – Parent. *"A group of us moms meet at least monthly at ECHO to take advantage of this thoughtful program."* - Member Mom with friends. *"While my child is having fun, I am surprised at how much I learn each week."* – Parent.

Current Science Workbench

The Current Waves Workbench was developed in conjunction with University of Vermont's Rubenstein Ecosystem Laboratory to allow visitors to experiment and explore concepts about the Lake Champlain Basin and watersheds around the world. The Workbench, a free standing cart-like structure, allows exhibit interpreters to interact one-on-one or with small audiences using graphics, media, artifacts, and hands-on activities. Workbench topics are created to support traveling exhibits, new permanent exhibits and seasonal themes. Their role is to provide a cost-effective way to quickly respond to emerging current science issues.

Results: Working closely with the University of Vermont, topics are changed three times per year on the Workbench. The Workbench is available to all ECHO guests. Topics include: paleolimnology, fisheries, blue green algae, ice and snow, salmonids, eels, among many other natural history, stewardship and personal responsibility issues.

Guest Comments: *"With the lake in trouble, I do wonder about what is being done. This exhibit helped me understand the issues about algae."* Adult in a group. *"I really think this program is what science education should look like."* Elementary Teacher.

Volunteer and Intern Training and Interactions

Our ability to interact with guests throughout their ECHO experience requires the talents of hundreds of volunteers. Volunteer and Intern Exhibit Interpreters receive ongoing training and support to keep them up-to-date on current Basin issues, our changing exhibit experience including: traveling exhibits, Workbench topics, and animal husbandry.

Results: Annually, over 200 volunteers and interns are extensively trained and provide a rich experience for ECHO guests. Since 2006, over 81,000 hours of time have been donated by the volunteer and intern corps. This extraordinary service is the key to: 1) providing the type of one-on-one experience for guests with a trained educator and 2) controls costs of experience delivery. Additionally, this program provides the community with a growing cadre of lake conservation and restoration experts (the volunteers and interns) no matter where their next endeavor takes them. Over 1,000 have participated in the program, many still teaching at ECHO after many years of service.

Guest Comments: *"I have volunteered at ECHO for 8 years. The staff is very helpful in assisting us to learn and better engage ECHO's visitors."* – Volunteer. *"As the member of a team of five interns, we learn a great deal about the lake's ecology, but also how to actively engage ECHO's guests."* – College Intern.

Live Animal Exhibit Upkeep and Maintenance

Our Animal Ambassadors represent much of what is unique about ECHO. It is critical that we provide them with round-the-clock care and house them in the best of habitats. This requires the skills of our trained Animal Care staff and many volunteers who assist with daily animal husbandry. It also necessitates state-of-the-art aquaria, filtration systems, and natural habitats. Our interactive guest experience also requires extensive care to keep exhibits in good working order and to supply the props and materials for demonstrations and activities.

Results: During the six years of the grant, ECHO provided care for 70 species of animals, 58 which are found in the Lake Champlain Basin (ECHO's Frogworld exhibit presents the plight of these amphibians from around the world – thus 12 of the total species are not from Lake Champlain). As compared to industry standards, animal mortality is very low. With 2,000 animals at ECHO we lose between 5 and 10 key animals annually, an expected loss due to age and the stresses of artificial habitats. Necropsy is performed and lab tests are provided if a pathogen or special insight is required. A team of three animal care staff oversee a volunteer and intern corps of 200 that clean habitats weekly, assess animal health and needs daily, assess water quality daily, and provides routine maintenance on the pumps, filters and other water quality equipment to support 2,000 animals in 20,000 gallons of aquaria. All state and federal permits are updated as required and secured for species changes. Due to very high standards, we have been selected by

the state herpetologist as a site for the threatened spiny soft-shelled turtle headstart program – where we over winter 40 to 60 neonates for release the following summer. We also have received national recognition for our rearing of frogs and are part of a national program to rear selected species for public presentation.

Participant Comments: *“I have learned sooooo much at ECHO.”* – Animal Care Volunteer. *“My internship is an important part of my college experience and will be very helpful in finding a job.”* – Intern.

Voices for the Lake

Voices for The Lake (VFL) is an initiative to inspire Lake Champlain Basin stewardship through conversations & connections enabled by social technologies like Facebook and YouTube. Through an outreach program which involves video capture, VFL collects stories and concerns about the Lake from visitors to ECHO and from different communities in the Lake Champlain Basin. These videos are placed on the VFL website, on a dedicated YouTube channel, and ultimately reside in an interactive exhibit at ECHO. The goal of the project is to raise awareness and build community around lake stewardship by using real stories from people who feel passionately about Lake Champlain and the surrounding watershed. The online and exhibition experience opened in August 2010.

Results: During VFL’s first year of use, we witnessed 125,032 users either loading up their own videos, stories, or photos, or viewing the work of others. This highly interactive online and on-site exhibition provides a mechanism for people to share their stories and passions about Lake Champlain.

Chart 2: Voices for the Lake Website and Exhibition Use

	FY2011
Pageviews (visits)	23,682 (4,652)
Facebook Impressions	95,014
Facebook Friends	406
YouTube Uploads (views)	1,552 (11,140)
Twitter Follower	1,265
Twitter Posts	3,113
VFL total electronic media	125,032

Guest Comments: *“I love to check out what pictures other folks have uploaded about places near my home.”* - On-site User. *“Searching either by location on Google Maps or by key words helps me find local folks interested in the Lake.”* - Teacher. *“My students uploaded their recent PSA’s about the Lake and were thrilled that their work was available for others to look at.”* – Teacher.

ECHO's Open Door Access Program

ECHO's Open Door Access Program, launched in the fall of 2005, includes a broad spectrum of programs designed to reduce the cultural, financial and geographic barriers that exist and prevent potential guests from visiting ECHO. Developed in collaboration with various community partners, this multi-faceted access program has met with great success and continues to grow. It is ECHO's belief that we cannot truly fully impact the community's stewardship of Lake Champlain unless we are able to reach everyone. Our community partners, including social service agencies, schools, business and fellow non-profits, have strongly encouraged us to continue all aspects of the ECHO Open Door program. The following summarizes the components of the program, audience size and impact, and the multi-year audience of this highly sought-after program.

ECHO Access for Social Service Organization Clients

ECHO distributes discount admission vouchers and annual passes through 49 regional social service agency partners to: youth, senior citizens, individuals with disabilities, and low income community members. Working with agencies that have a strong and trusted relationship with these constituencies enhances visitor comfort level and encourages them to experience a place that they might not otherwise visit. Organizations wishing to be part of ECHO's Open Door Access Program are evaluated for program fit. Each agency completes a partnership assessment which allows ECHO to better understand the organization's mission and client needs and to train our staff and volunteers on how to welcome guests and interpret exhibits to maximize their comfort level. Clients often visit ECHO in peer groups accompanied by familiar agency staff or individually with their own mentors. Agencies can assess the needs of their constituents and use the vouchers or annual passes accordingly either distributing them to individuals who visit ECHO on their own or using them for planned group visits.

Results: The voucher program annually distributed, on average, 6,000 day passes providing access to ECHO for \$2.00 admission per person. The social service agencies may distribute the passes individually or utilize them to bring groups to ECHO.

Public Comments: *"If it wasn't for the Open Door program, I wouldn't be able to take my kids to ECHO."* – New-American Mom. *"Our agency works closely with ECHO to utilize an ECHO visit as a special incentive for participation in our programs – and to think there is an extra educational opportunity – makes the program all that more useful. Thank you ECHO"* – Agency Supervisor

ECHO Membership Matching Program

The Membership Matching gift program works as follows - for every membership purchased during the November/December holiday season, ECHO provided partnering social service agencies with one membership that can be distributed to a person or family in need. The social service agencies will present the memberships directly to their clients. On average, 300 memberships were distributed annually. Each membership has a \$120 value and is good for up to two adults and three children. The membership provides unlimited admission to ECHO and to over 310 other science centers, invitations to all

ECHO exhibit pre-opening events and advanced information about ECHO programs and exhibits.

Results: On average, ECHO provided 300 Family Memberships annually to families defined as in-need by the partner social service agencies.

Public Comments: *"As a family, we used our membership nearly weekly as a way for my kids to stretch their legs, learn about the Lake and enjoy the Lake's beauty."* – Parent.
"The look of amazement in the kid's eyes when they first arrive is a real joy to all of us who work the admissions desk." - ECHO Guest Services Associate.

Library ECHO Pass Program

In the Lake Champlain Basin, there are 575 town, school and academic libraries serving the more than 600,000 residents of the region. This component of the access program serves Lake Champlain Basin library patrons by offering day passes to each local library at no cost. Patrons, who check out a pass, like they would a book, can visit ECHO for the significantly reduced admission price of \$4.00 per person. The program was developed in partnership with the Vermont Department of Libraries and the Vermont Libraries Association who have helped to announce and publicize it to libraries throughout the Basin. The Library ECHO Pass Program has been enormously successful, with passes being used on almost a daily basis by residents from nearby Chittenden County to Newport, Vermont to Saranac, New York.

Results: ECHO distributed Library Passes to 575 libraries annually, throughout the Lake Champlain Basin, by providing a Pass for checkout like a book.

Public Comments: *"The wait for the ECHO pass can be up to 6 to 8 weeks. It is a real service to our patrons – and they get the opportunity to see some of the Lake's amazing creatures."* – Librarian in large Chittenden County town. *"Having the poster and ECHO pass at our front desk drives use of the library."* – Librarian in small, rural Vermont community.

ECHO School Ambassador Program

Vermont and New York educators received free daily admission to ECHO. Teachers who served as a School Ambassador — the liaison between ECHO and their school — received additional benefits. The School Ambassadors are a key component of successful school programming at ECHO. They disseminate information about ECHO's class programs, upcoming exhibits, special events, teacher training, links to science grade expectations and group discounts. In this role, they are the voice of ECHO during staff or PTO meetings when field trip opportunities are discussed. They are generally well versed in ECHO programs and can assist teachers in selecting an appropriate class, suggest self-guided activities, and support logistics planning by explaining in person how ECHO operates from parking, to check-in, to lunch-time to departure. Essentially, the ECHO School Ambassador is a coach and a contact that will help improve the quality of and participation in ECHO programs.

Results: ECHO distributed, on average, 300 Memberships to ECHO School Ambassadors annually. Each membership has a \$100 value and is good for up to two adults and two children. The membership provides unlimited admission to ECHO and over 310 other science centers, invitations to all ECHO exhibit pre-opening events and advanced information about ECHO programs and exhibits.

Public Comments: *"As a teacher with so many daily issues, it was nice to receive a special gift for supporting my colleagues in utilizing the resources ECHO provides. It has increased my use of ECHO for I now receive special info about upcoming programs and exhibits."* – Elementary Teacher.

Scholarships and School Discounts

Providing student access to a broad array of educational experiences is a major focus of ECHO's Open Door Program. This program provides special resources for schools that cannot afford admission or transportation, stipends for college interns and stipends and training for local youth involved in ECHO's year-round youth environmental outreach group.

Results: Annually, on average, \$6,000 was allocated for school admission discounts, \$4,000 for three summer college internships and \$5,000 to support ECHO's youth environmental outreach group (approximately 20 students), the E-Team. The school discount program provides \$3.00 per student to help support the attendance of up to 13,000 Lake Champlain Basin students visiting ECHO.

Public Comments: *"I have learned so much about the Lake and Basin. Did you know that many people think there are whales in the Lake? We have so much education work to do."* – College Intern. *"Help with the cost of admission in these days of tightening school budgets is such a help to us."* – Middle School Principal.

ECHO Community Science Nights

Community Science Nights are held six times per year. These evening events provide free, exclusive access to the "ECHO experience" for segments of the community who experience some type of financial, cultural or geographic barrier to access. Evenings are staffed by the E-Team (a special team of youth that are trained to interpret ECHO exhibits for guests). The evening starts with dinner and includes games and other activities and opportunities to socialize for all of the individuals and families visiting. ECHO partners with various social service agencies to identify and facilitate participation by those who would not normally have access to ECHO. Transportation is provided by ECHO when necessary.

Results: On average, seven hundred people visited ECHO annually at a discount of \$9.50 per person through the six ECHO Community Science Night programs.

Public Comments: *"We are so proud when our very own communities visit ECHO."* - E-Team Member.

EPA Grant LC 97144701 – Consolidated Actual vs. Budget Grant Expenditures

	<u>Budget</u>	<u>Actual</u>	<u>Difference</u>
EPA Reimbursement Amount			
Personnel	\$782,411	\$746,462	(\$35,949)
Fringe Benefits	\$203,428	\$194,028	(\$9,400)
ECHO Open Door Access	\$712,984	\$667,379	(\$45,605)
Exhibits	\$58,724	\$109,697	\$50,973
ECHO Encounters	\$166,259	\$108,741	(\$57,518)
Indirect Costs	\$343,444	\$438,381	\$94,937
Total	\$2,267,250	\$2,264,688	(\$2,562)

ECHO Match Amount			
Personnel	\$466,971	\$424,866	(\$42,105)
Fringe Benefits	\$65,580	\$54,605	(\$10,975)
ECHO Open Door Access	\$118,577	\$141,559	\$22,982
Exhibits	\$0	\$13,605	\$13,605
ECHO Encounters	\$24,800	\$23,621	(\$1,179)
Indirect Costs	\$111,481	\$129,154	\$17,673
Total	\$787,409	\$787,409	\$0

Total Grant Expenditures			
Personnel	\$1,249,382	\$1,171,327	(\$78,055)
Fringe Benefits	\$269,008	\$248,633	(\$20,375)
ECHO Open Door Access	\$831,561	\$808,938	(\$22,623)
Exhibits	\$58,724	\$123,302	\$64,578
ECHO Encounters	\$191,059	\$132,362	(\$58,697)
Indirect Costs	\$454,925	\$567,535	\$112,610
Total	\$3,054,659	\$3,052,097	(\$2,562)

Budgeted grant reimbursable expenditures totaled \$2,267,250. Actual grant expenditures were \$2,264,688 leaving an unexpended grant amount of \$2,562. The most significant variance relative to budget occurred in indirect costs. The earliest budgets utilized an estimated rate of 35%, which grossly underestimated the appropriate indirect cost application amount. When subsequent actual rates were negotiated through the U.S. Department of the Interior, they were significantly higher. The higher indirect cost application rate necessitated reduced levels of personnel related expense reimbursement requests in order to access the available funding. Other variances are primarily related to budget estimation issues.

SUMMARY

ECHO effectively utilized funding from EPA Grant LC 97144701 to continue to strengthen and promote stewardship of the Lake Champlain Basin. Grant proceeds were used to support *Opportunities for Action* as defined and stated in the Lake Champlain Basin Management Plan. Public involvement is critical to achieving the goals outlined in the *Opportunities for Action* plan and protecting the future of the Lake Champlain Basin. ECHO continued to encourage public involvement by educating people about issues facing the Basin and how they can care for their watershed. ECHO's Open Door Access Program and ECHO Encounters are both proven, effective means of increasing admissions to ECHO. Increased admissions to ECHO arguably translated into a higher level of community knowledge regarding environmental challenges and potential solutions. This knowledge further contributed to personal and collective action to improve and sustain the Lake Champlain Basin environment for current and future generations.